

REMARKS

This application has been carefully reviewed in light of the Office Action dated January 31, 2006. Applicants have amended claims 1 and 7. Reconsideration and favorable action in this case are respectfully requested.

The Examiner has rejected claims 1-12 under 35 U.S.C. §103(a) as being unpatentable over U.S. Pub. No. 2002/0075080 to Nelson in view of U.S. Pat. No. 6,323,736 to Jansson. Applicants have reviewed these references in detail and do not believe that they disclose or make obvious the invention as claimed.

The Examiner states that Nelson shows all of the elements of claims 1 and 7, with the exception that Nelson does not explicitly disclose that the VCO is a digitally controlled LC VCO with a bank of capacitors. Jansson is provided to teach a LC VCO with a digitally controlled bank of capacitors.

The present invention, as defined by claim 1, includes (in part):

logic circuitry for calibrating the voltage controlled oscillator to a frequency range inclusive of a new desired frequency responsive to a change in the divisor by:

performing a coarse search by operating the voltage controlled oscillator at a single predetermined control voltage for various capacitive settings of the bank to determine an initial control word for configuring the bank; and

testing the initial control word to determine whether the initial control word should be used to generate the first clock signal at the new desired frequency or whether the initial control word should be changed to an adjacent control word to generate the first clock signal at the new desired frequency.

The logic circuitry thus performs two functions which accurately and quickly calibrate a VCO. First, a coarse search is performed at a single control voltage at various capacitive settings of the bank. This yields an initial control word. The initial control word is then tested to determine whether it should be used to generate the first clock signal at the new desired frequency, or if the initial control word should be changed to an

adjacent control word to generate the first clock signal to generate the first clock signal at the new desired frequency.

Contrary to the Examiner's statement, the Nelson reference does not provide any teaching of testing at the initial control word to determine whether it should be used to generate the first clock signal at the new desired frequency, or if the initial control word should be changed to an adjacent control word to generate the first clock signal to generate the first clock signal at the new desired frequency. On the contrary, Nelson explicitly states in paragraph [0024] that:

By purposefully selecting VCO center frequency control signals, L, state machine 32 may identify the two VCO operating curves that have center frequencies just above and just below the frequency of the input signal R. *Either one of these two operating curves may be selected for use during normal PLL operations.*

Accordingly, *no* testing is done after the initial search, and there is no determination made as to whether a control word adjacent to the initial control word would be better for generating the first clock signal at the new desired frequency.

With regard to the dependent claims, the Examiner makes further statements concerning the testing function of the logic circuitry. With regard to claim 3, the Examiner states that Nelson teaches the function of testing an initial control word by comparing the frequency to upper (max) and lower (min) bounds of a frequency range for the VCO while configured to the initial control word, referring to paragraph [0018] of Nelson. This paragraph has no such teaching – it is simply a description of the exemplary operating curves shown in Figure 2A, and contains no teaching of testing at the endpoints of the curves, or anywhere else on the curves.

The Examiner states that paragraph [0022] of Nelson shows the subject matter of claim 4, wherein the logic circuitry determines the initial control word using fast comparisons between an actual frequency at the predetermined control voltage and the desired frequency and determines whether the initial control word should remain the same

by using more precise comparisons between the actual frequency and the desired frequency. There is no such teaching in Nelson. Paragraph [0022] states that during *normal* operations, SW1 is closed and SW2 is open, the allowing loop-filter voltage V_{LF} to be applied to the VCO. There is no teaching that SW1 is used during a *test* mode to determine whether the control word providing the preferred operating curve.

The Examiner states that paragraph [0018] of Nelson shows the subject matter of claim 5, wherein the logic circuitry tests the initial control word by determining whether the difference between the desired frequency and an actual frequency for the voltage controlled oscillator while configured according to the initial control word is within a predetermined threshold. This paragraph has no such teaching and, in fact, comes before calibrating the VCO is even discussed in Nelson.

Accordingly, Nelson does not show the logic circuitry as specified in claim 1. Applicants respectfully request allowance of this claim, along with dependent claims 2-6. For reasons set forth in connection with claims 1 - 6, Applicants believe that independent claims 7 and dependent claims 8-12 are allowable as well.

An extension of two months is requested and a Request for Extension of Time under § 1.136 with the appropriate fee is attached hereto.

The Commissioner is hereby authorized to charge any fees or credit any overpayment, including extension fees, to Deposit Account No. 20-0668 of Texas Instruments Incorporated.

Applicants have made a diligent effort to place the claims in condition for allowance. However, should there remain unresolved issues that require adverse action, it is respectfully requested that the Examiner telephone Alan W. Lintel, Applicants' Attorney at (972) 664-9595 so that such issues may be resolved as expeditiously as possible.

For these reasons, and in view of the above amendments, this application is now considered to be in condition for allowance and such action is earnestly solicited.

Respectfully Submitted,

/Alan W. Lintel/

Alan W. Lintel
Attorney for Applicant(s)
Reg. No. 32478

June 28, 2006
Anderson, Levine & Lintel
14785 Preston Rd.
Suite 650
Dallas, Texas 75254
Tel. (972) 664-9595